

# Improving Profitability by Harnessing Lean AND MAPICS XA

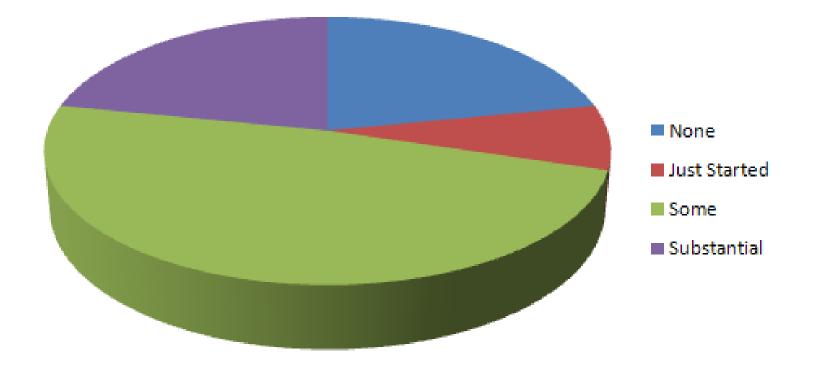
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### Where are you in your lean journey?

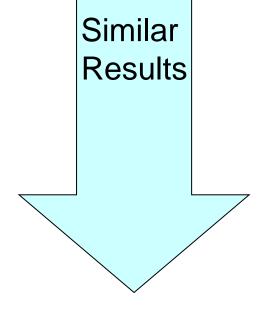




- What is Kanban?
- Kanban Considerations for Different Businesses
- Electronic Kanban
- Kanban Best Practices
- Next Steps
- Questions

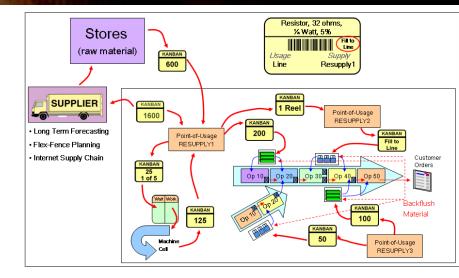
#### Implementing Lean manufacturing -Different Methods

- Demand Flow
- Demand Pull
- Continuous Flow
- Kaizen
- Kanban
- Visual Manufacturing
- Gateway Manufacturing
- Point of Production Manufacturing
- Point of Consumption Replenishment
- Toyota Production System
- Vendor Managed Inventory (VMI)



# What is KanBan?

- What is Kanban
  - Signal
    - A card, ticket, empty container, etc
    - A system or a set of rules
  - Shop floor execution tool
  - Visual based pull system
  - Moves parts to point of consumption
- Some Challenges
  - Managing all the cards
  - Update inventory in planning system
  - Setting Kanban sizes, and revising as demand changes
  - Lot and serial tracking



## Mixed Mode Kanban

- Multiple product models in production process
- Make to order, engineer to order
  - Kanban common parts (i.e. fasteners, fittings, tooling)
  - Kanban raw materials (i.e. sheet steel, bar stock)
- Kanban for each order

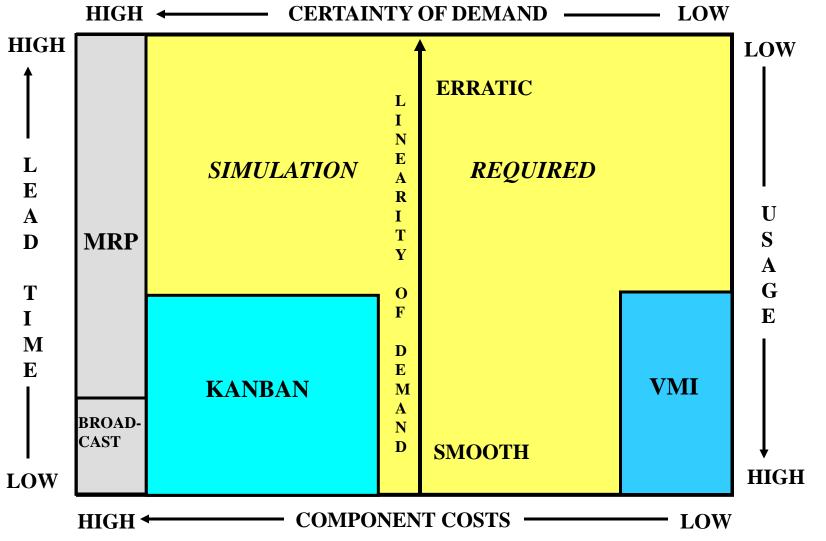
# Kanban Uses

- Kanban uses
  - MRO items
  - Safety supplies, janitorial and maintenance items
  - Office supplies
  - VMI
  - Third Party Logistics (3PL)
  - Remote locations
  - Consignment Inventories

### **Recommended Reading**

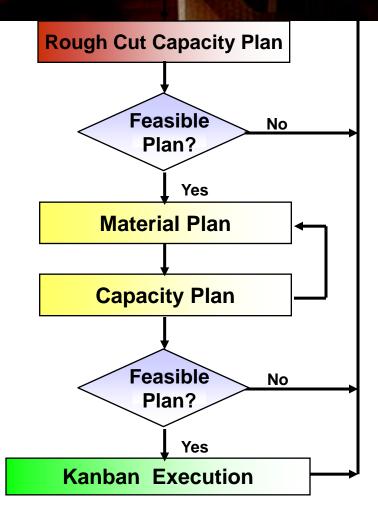


# What Items Should be on Kanban?



Copyright Replenishment Technology Group

#### **Master Schedule**





### Business needs are varied

• We need to be able to simplify how we control inventory and execution on the plant floor...

#### Kanban

- But, we still need to
  - Forecast and transmit our future requirements to suppliers
     MRP
  - Be able to provide accurate inventory information to other areas of the organization. Perpetual Inventory

# **E-Kanban Customers Stories**



### • JLG Industries

 World's leading producer of aerial work platforms and man-lifts

### York International

 World's leading producer of air conditioners and refrigeration units

- Meridian
  - Automotive
    - Manufacture of exterior automotive parts and assemblies
- Stant Manufacturing
  - Manufacturing of Automotive gas caps, radiator caps, valves, fuel system components

# University of Michigan Study

- 60% Reduction in Inventory (inhouse)
- 30% Reduction in Inventory (throughout the supply chain)
- 88% Reduction in Transaction Costs
- 75% Reduction in Lead Times
- Increased ability to customize products and increase margins

### **Electronic Kanban**

What does Electronic KanBan do?

- Streamlines inventory moves and enhances inventory visibility
- Takes advantage of pre-existing procedures inherent in an N-Bin kanban system
- Provides "Low Touch" techniques to automatically release & complete
  - Manufacturing Orders
  - Repetitive Schedules
  - Purchase Orders (blanket, discrete or perpetual)
  - Interplant orders (ISL)
  - Inventory Transfer Orders (TW, IS, etc.)
- Easily extends kanban techniques to work with suppliers, sister plants, etc.



# **Electronic Kanban**

- Proven Results
  - Fast Implementation simple tailoring options
  - No additional staff needed to manage kanban system
  - Better historical information to manage inventory such as replenishment history
  - Utilizes disciplines already in place fits your organizational needs



#### **JLG Industries**

- Challenges
  - Long Cumulative Manufacturing Lead Times
  - Production vs. Service Parts
  - Customers demand on-hand inventories or they go elsewhere
  - Acquisitions throughout the world
  - Need for Tighter Integration with Customers and Vendors as well as distributors

## JLG Industries

#### <u>Before</u>

- 88 Day cumulative mfg. lead times
- Fat Raw Material Inventory
- Large WIP Inventory

### <u>After</u>

- 7 Day cumulative mfg. lead times
- Turned an entire warehouse into additional production lines
- Increased Inventory turns 171%

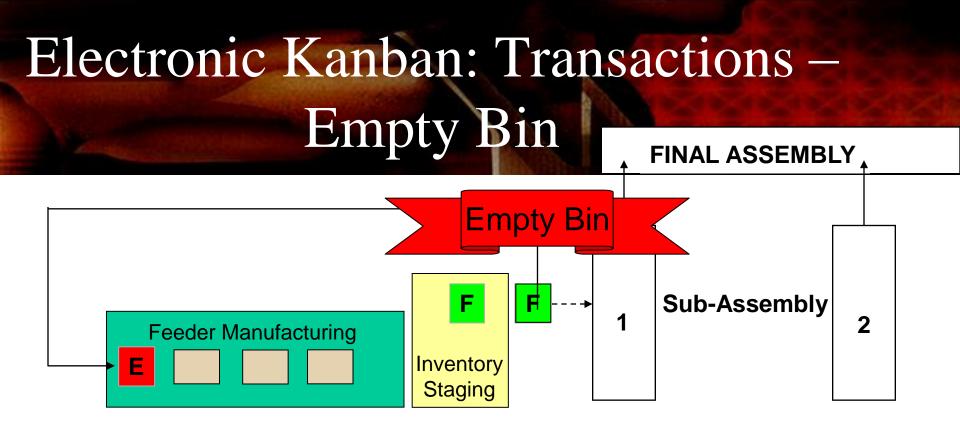
## York International

- Reduced component lead times from 10 days to less than 1 shift
- Implemented at 7 locations (in US and Mexico) in a matter of weeks
- Reduced inventory and better managed seasonal demand through use of Electronic KanBan historical information
- Eliminated 6 full-time temporary employees used for data entry of manual kanban information
- Streamlined vendor analysis



GEO STANT

- Began Implementing in 1998
- Running in multiple plants through-out US and Mexico
- Reduced cumulative manufacturing lead-times from 30 days to 2
- Reduced inventory by \$10M
- Annualized Savings \$2.2M+ in one plant



- 2-Bin Kanban
  - Subassembly work area depletes one bin
  - When we have an "Empty Bin", the workers begins to work out of other bin.
  - The "Empty Bin" is the signal to replenish the empty bin in the feeder area.
  - Many ERP systems signal work with a
    - Work Order for Manufactured parts
    - Purchase Order for Purchased parts

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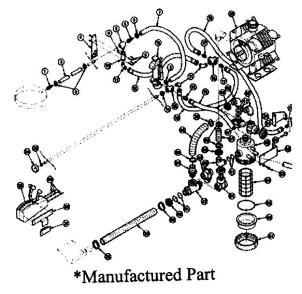
GRADE 8 BOLT 1x3 CARD NO: 1

SUPPLIER: Purchase VENDOR: Bolt supply company KANBAN QTY:

100

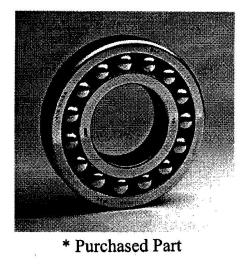


PART: Sprayer Assembly PART #: 3030 WAREHOUSE: 1 WORKCENTER: AA001 CARD NUMBER: 001 QTY: 10





PART: Bearing (1.5X.5) PART #: BG0005 WAREHOUSE: 1 WORKCENTER: AA001 CARD NUMBER: 001 QTY: 10



### **Bin Sizing**

• Kanban Lot-Size Formula

Kanban lot size = 2\*ADD\*(RLT + SSD)
Where ADD is Average days demand
RLT is Replenishment Lead Time (or decimal fraction)

SSD is Safety stock days (or decimal fraction)

# Bin Sizing

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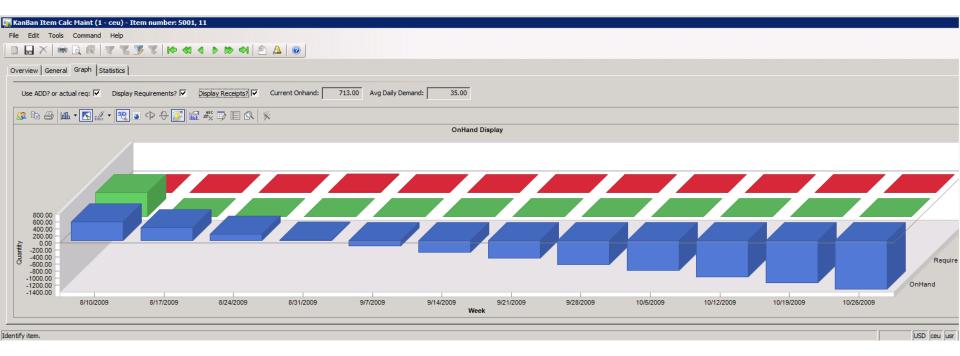
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Overview General Graph Statistics

Item number	Category	LT	Act-Bins S	Avg Bin Size	Total Bins Qty	Safety Stock Qty	Μ.	Total Req	Req Days	Avg Daily	Status	Calc Total Bin Qty	Calc # Bins	Vendor	Туре		Sync Calc Table
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6001		14	1	20	20	0		432	30	15	add bin(s)	420	21	5001 - Forth Packaging	PURCHASE	_	Calculator Update
7001		1	2 🗸	50	100	0		553	30	19		38	1	-	PRODUCTION		Calculator Report
7035		1	3 🗌	20	60	0		143	30	5	remove bin(s)	10	1	-	PRODUCTION		
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# **Bin Sizing**



# **Bin Optimization**

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Containers:	2	New Value:	28.00									
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Unit-Cost:	2.00											
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Day	Demand	Bin 1 Ending	Bin 2 Ending	Bin 3 Ending	Bin 4 Ending	Bin 5 Ending	Bin 6 Ending	Bin 7 Ending	Bin 8 Ending	Due	Triggered	Ending OnHand	SS	Stockout	▲	
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KANBAN Scorecard (1)	
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Overview	
Bins	History - Released
Total Bins:	Production orders released YTD: 4
Total Suspended: 1	Purchase orders released YTD: 5
Production Bins: 4	Production orders released LY: 0
Purchasing Bins: 2	Purchase orders released LY: 0
Туре	History - Received
KANBAN Type: 6	Production orders received YTD: 1
TRANSFER Type: 0	Purchase orders received YTD: 6
Orders	Production orders received LY: 0
Bins with Open orders: 3	Purchase orders received LY: 0
Open orders Late: 2	History - Print Transfer
	Print Transfer YTD: 0
	Print Transfer LY: 0
	History - Transfer
	Transfer YTD: 0
	Transfer LY: 0
	History - Errors
	Errors YTD: 0
	Errors LY: 0



### Electronic KanBan

Adds the following transactions to PM&C

- @E (empty) Drives new MO, repetitive schedule, PO or blanket release, InterSite Transfer
- @F (full) takes appropriate action close oldest order and back flushes labor and/or allocations
- @T (transfer print) Print kanban transfer label
- @X (warehouse transfer) Internal kanban transfer



### Let's see it! Tailoring

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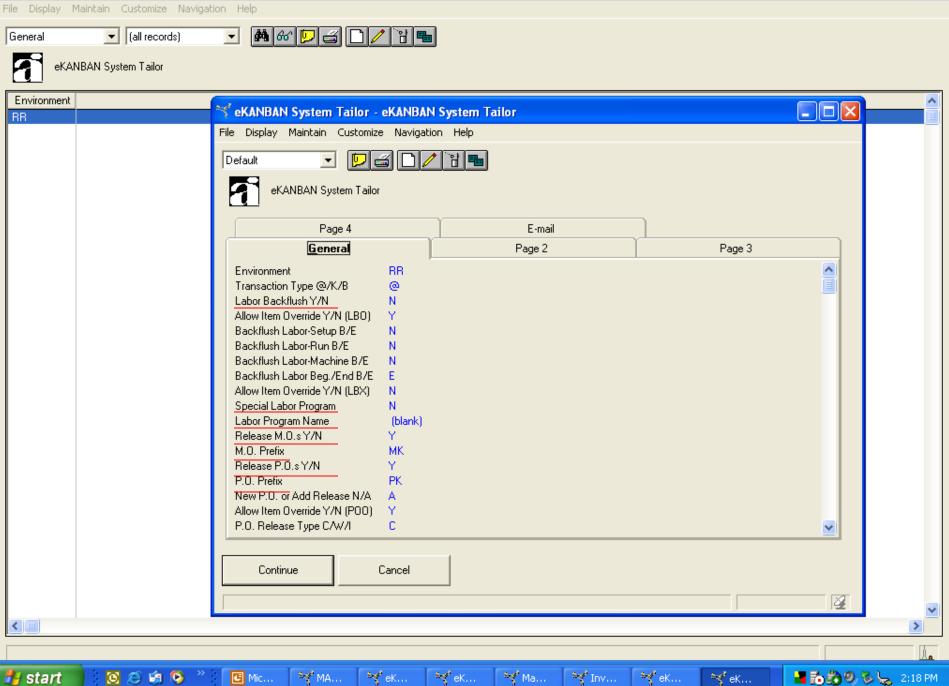
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RR	1	BG0005	AA001	1
RR	1	BG0005	AA001	2
RR	1	BG0005	AA001	3
RR	1	BOTTLES	AA001	1
RR	1	C100	AA001	1
RR	1	C100	ASMB1	1
RR	1	P101	AA001	1
RR	1	TROY	AA001	1
RB	1	XFRTST	AA001	1
RR	1	03415	AA001	1
RR	1	12345	AA001	1
RR	1	12345	AA001	2
RB	1	12345	AA001	3
BB	1	12345	AA001	4
BB	1	12345	AA001	5
RB	1	12345	AA001	6
RB	1	12345	AA001	7
BB	1	12345	AA001	8
RR	1	12345	AA001	9
RB	1	12345	AA001	999
RB	1	12345	ASMB1	1
RB	1	1400	AA001	1
RB	1	1400	AA001	2
BB	1	1400	AA001	3
RB	1	23456	AA001	1
RB	1	23456	AA001	2
RB	1	23456	AA001	3
BB	1	23456	AA001	4
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#### eKANBAN System Tailor





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### Let's see it! Transaction

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# Supplier Communications

#### E-mail notification to Suppliers

	The user receives an
	email when a new PO is
From: Cistech [mailto:cistechsupport@cistech.net]	cut for them telling them
Sent: Friday, February 17, 2012 2:25 PM	that they have a new PO
To: Denise Luther Subject: New Posting on Cistech Portal	awaiting their acceptance.

A new PO Item Release has been posted on the Supplier Portal.

Order Number: P001307 Release Number: 2 Item Number: 1003 Quantity: 15.000 Due Date: 2/24/12

Please connect to the portal and take appropriate action. The web address of the portal is: www.catavolt.net/abctech

ABC Tech Purchasing

#### View and Confirm Purchase Orders

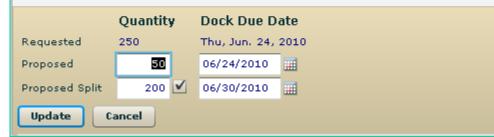
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		1	1010	COV1757		10/10/2000	25	F.A.	00/22/2000	N	•	
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## Propose Changes to Purchase Orders

#### Propose Order Change

X

Change the proposed quantity or arrival date to propose a change to this open order. Change the split quantity and arrival date to propose splitting this order. Press Update when finished.



Current Orders	General 🛛 🔻 💼 🖉 🛇 🖨 🇊 🕼 🖉 🗜									
Description	Dock Due Date	Qty	UM	Price	Status	Comment	Proposed Quantity	Proposed Dock Date	Proposed Split Qty	Proposed Split Date
LASER, 20X MAX CD	07/08/2010	500	EA	16	Shipped		0		0	
2.93 GHz Dual Core	06/24/2010	250	EA	357.28	Proposed		50	06/24/2010	200	06/30/2010
NETWORK CARD, FAX/MODEM 56K	06/29/2010	750	EA	67	Customer Review	1. Sec. 1. Sec	750	07/06/2010	0	
PC, 266 MHZ, DESKTOP	06/24/2010	1,000	EA	508.87	Shipped	Supplier	0		0	
LASER, 20X MAX CD	06/25/2010	500	EA	16	Shipped	100 C	0		0	
CONTROLLER, 24X MAX CD	06/29/2010	1,000	EA	53.5	Revised		0		0	

# Send Shipment Notifications

Send Shipment Notice									
Shipment	40-2009-08-20	_							
	Date	Time							
Document Origin	12/14/2009	0 : 00 am							
Departure	07/08/2010	10:37 am							
Arrival	07/13/2010	2 : 00 pm							
Bill of Lading		Manifest							
Freight Terms									
Transport									
Method	Consolidated tr								
Carrier ID	_	Tracking Num							
Vehicle		Туре		Route					
Weight									
- Unit of Measure									
Gross		Tare		Net					
Item	Ordered	Shipped	Remaining ship date	Remaining quantity					
P000457/1000/1	1	1	//	0					
P000457/1000/2	2	2	//						
P000457/1000/3	3	3	//						
P000457/1000/4	4	4	//						
Send Cance	a								
	_								

# Suppliers Can View Forecasts

00	pplier # 1 .	Site ID 2 A Springfield		Forecast Total	JAN 1 2010						All	• 🖻 •
00	7000				JAN 1 2010						1	
00		Springfield		10.000		JAN 8 2010	JAN 15 2010	JAN 22 2010	JAN 29 2010	FEB 5 2010	FEB 12 2010	FEB 19 201
	7000		1000	0	0	0	0	0	0	0	0	
00		Springfield	1001	1,870,480	57,823	100,488	69,111	99,692	207,631	207,631	209,578	187,69
	7000	Springfield	1002	137	60	0	7	6	8	8	7	
00	7000	Springfield	1003	970	48	103	74	70	82	82	92	1
00	7000	Springfield	1100	410	0	0	37	35	41	41	47	
00	7000	Springfield	1103	2,124	0	0	188	166	221	221	224	24
00	7000	Springfield	1104	556,143	31,640	43,728	41,782	46,213	54,375	54,375	59,834	60,20
00	7000	Springfield	1105	155,070	9,600	11,520	11,936	10,532	14,043	14,043	14,041	15,03
00	7000	Springfield	1106	1,805,234	204,417	161,526	147,928	152,727	147,062	146,462	156,368	166,7
00	7000	Springfield	1107	2,043,036	117,012	113,596	140,663	140,405	100,907	100,907	207,892	204,4
00	7000	Springfield	1108	384,359	29,401	32,620	37,407	25,130	32,610	32,610	33,273	35,6
00	7000	Springfield	1109	565,853	38,018	39,637	30,927	29,141	36,080	34,480	37,801	72,0
00	7000	Springfield	1200	7,213,005	473,887	486,657	500,758	427,805	543,989	537,989	559,726	812,72

### Suppliers Can View Inventory

							dluther7000 CISTE	CH, Inc Logout Help
CIST	ECH	Home Administration S	upplier Portal Recovery					
Launch		Supplier Managed Inventory						
Open Orders							General	• 🖉 👂 •
1	Item number 1 A	Vendor catalogue number 2 🛦	Item description	Warehouse 3 A	Warehouse description	Available	Minimum quantity	Maximum quantity
Forecasts	1000	LLK-003-087	2.93 GHZ DUAL CORE	1	ABC TECHNOLOGIES - MAIN WHSE	614,429	0	0
	1322	CAT-00331	MOTHERBOARD CHIP, 450MHZ	1	ABC TECHNOLOGIES - MAIN WHSE	0	500	3,000
Document Management								
- 💊 -								
Accounts Payable View								
<b>9</b>								
Supplier Managed Inventory								



#### Implementing Kanban Best Practices

#### Kanban Tools

- Kanban Optimizer Determines which items are an ideal fit for kanban replenishment
- Kanflow Determines ideal inventory levels for items with non-linear demand patterns

#### Kanban Methods

- One time use containers (temporary or generic
- Permanant containers
- Single Bin
- 2 or 3Bin
- Cards (Single or multi)
- Kanban squares

#### Kanban Methods

- Kanban carts
- Supplier cards
- Andon lights
- Jidoka (production line signals)

















#### **Other Kanban Techniques**

- Finished goods kanban
- Kanban of non-production items
  - Office supplies
  - Safety supplies (safety glasses, gloves, first aid)
  - MRO items (hydraulic fluid, tape, tools, packaging)

#### Where to Start

- Purchased Parts
- Service Parts
- Manufactured Parts

#### Working with Vendors

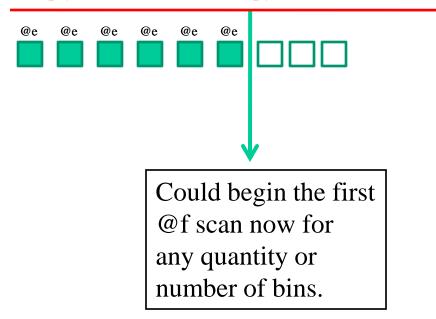
- Vendor Compliance
- Enhanced Vendor Communication and Collaboration
- Labeling, Lot sizing and other issues
- Performance and compliance
- VMI

#### **Best Practice Technique**

- Automated payment processing
  - Pay on receipt
  - Pay on use
  - EFT
  - What about accounting concerns?

#### **Flex Kanban Explained**

Empty Bin Scans each for qty 60. Max Bins = 6 new PO's or PO Release lines



Qty = 60, Sub bin trigger = DOES NOT GET USED, Flex = Yes Flex max bins = 6, Cum = No Max Bins defines how many @e scans will be allowed to take place for up to 6 open New PO's or 6 Blanket Release lines.

Test this yourself to verify the results.

#### **Other Concepts**

- Flex Accumulation uses external triggers

   (e.g. pick list print or shipment performs @E
   release when trigger point is hit)
- Bundled Kanban
  - Examples
    - @E creates inventory issue
    - @E creates automatic transfer to QC
    - @E creates automatic outside services plating P.O. and @F creates receipt of the P.O.

#### Next Steps

- 1. Conference Call to Review Lean Objectives
  - Questionnaire provided to discuss status and help prioritize requirements and objectives
- 2. On Site Assessment
  - Develop tailored solution and deployment plan
- 3. Deliver Proposal
  - Specific recommendations with ROI model compared to measurements and statistics in your industry



#### QUESTIONS?



#### Improving Profitability by Harnessing Lean AND MAPICS XA

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